

Louisville Metro Air Pollution Control District
850 Barret Ave., Louisville, Kentucky 40204
15 July 2009

Title V Statement of Basis

Company: Louisville Gas and Electric Company, Zorn Generating Station

Plant Location: 3001 Upper River Road, Louisville, Kentucky 40207

Date Application Received: 6-14-2004

Date Admin Complete: 8-14-2004

Date of Draft Permit: 25 March 2009

Date of Proposed Permit: 28 April 2009

District Engineer: Bob Wesely

Permit No: 131-97-TV (R2)

Plant ID: 1248

SIC Code: 4911

NAICS: 221112

AFS: 01248

Introduction:

This permit will be issued pursuant to: (1) Regulation 2.16, (2) Title 40 of the Code of Federal Regulations Part 70, and (3) Title V of the Clean Air Act Amendments of 1990. Its purpose is to identify and consolidate existing District and Federal air requirements and to provide methods of determining continued compliance with these requirements.

Jefferson County is classified as an attainment area for lead (Pb), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), 1 hr and 8 hr ozone (O₃), and particulate matter less than 10 microns (PM₁₀); and is a non-attainment area for particulate matter less than 2.5 microns (PM_{2.5}).

Application Type/Permit Activity:

☐ Initial Issuance

☐ Permit Revision

☐ Administrative

☐ Minor

☐ Significant

☒ Permit Renewal

Compliance Summary:

☒ Compliance certification signed

☐ Compliance schedule included

☐ Source is out of compliance

☒ Source is operating in compliance

I. Source Information

1. **Product Description:** Electricity
2. **Process Description:** Louisville Gas & Electric, Zorn Generating Station consists of one (1) natural gas combustion turbine, that provides emergency power for Louisville Water Company and peak load electrical power as required for the electrical power grid system.
3. **Site Determination:** There are no other facilities that are contiguous or adjacent and under common control.
4. **Emission Unit Summary:**

Emission Unit	Equipment Description
U1	One (1) simple cycle, combustion turbine, exhaust stack and 300 bhp, small bore, diesel, cranking engine

5. **Fugitive Sources:** There are fugitive NO_x emissions from the combustion of natural gas and diesel fuel.
6. **Permit Revisions:**

Revision No.	Issue Date	Public Notice Date	Type	Attachment No./Page No.	Description
N/A	12/22/1999	10/17/1999	Initial	Entire Permit	Initial Permit Issuance
R1	2/10/2002	NA	Administrative	Cover page	Corrected expiration date to 12/17/04
R2	7/15/2009	03/25/2009	Renewal	Entire permit	5 year renewal, Corrected usage limits for diesel fuel and natural gas, Additional ROs

7. Emission Summary:

Pollutant	Actual Emissions (tpy) 2007 Data	Pollutant that triggered Major Source Status (based on PTE)
CO	0.25	No
NO_x	0.96	Yes
SO₂	0.002	No
PM	0.02	No
PM₁₀	0.02	No
PM_{2.5}	0.02	No
VOC	0.0063	No
Single HAP	NA	No
Total HAPs	NA	No

8. Applicable Requirements:

☐ PSD ☐ NSPS ☒ SIP ☐ MACT
☐ NSR ☐ NESHAPS ☐ District-Origin ☐ Other

9. Future MACT Requirements: N/A**10. Referenced Federal Regulations in Permit:** N/A**II. Regulatory Analysis**

- 1. Acid Rain Requirements:** The source is not subject to the Acid Rain Program.
- 2. Stratospheric Ozone Protection Requirements:** Title VI of the CAAA regulates ozone depleting substances and requires a phase-out of their use. This rule applies to any facility that manufactures, sells, distributes, or otherwise uses any of the listed chemicals. This source does not manufacture, sell, or distribute any of the listed chemicals. The source's use of listed chemicals is that in fire extinguishers, chillers, air conditioners and other HVAC equipment.

3. **Prevention of Accidental Releases 112(r):** The source does not manufacture, process, use, store, or otherwise handle one or more of the regulated substances listed in 40 CFR Part 68, Subpart F, and District Regulation 5.15, *Chemical Accident Prevention Provisions*, in a quantity in excess of the corresponding specified threshold amount.
4. **40 CFR Part 64 Applicability Determination:** Zorn Generating Station is not subject to 40 CFR Part 64 - *Compliance Assurance Monitoring for Major Stationary Sources* since the company has accepted synthetic minor source limits for all regulated air pollutants for which the company is a major source.
5. **Basis of Regulation Applicability**

a. **Plant-wide**

Zorn Generating Station is a major source for the NO_x emissions. Regulation 2.16 - *Title V Operating Permits* establishes requirements for major sources.

The source is subject to a plant-wide NO_x limit of less than 100 tons during any consecutive 12-month period. The source is required to comply with the following single fuel consumption limits or combinations so that the permit limit is not exceeded.

Limit (12-month period)	Product
612 MMcf	Natural Gas
0.326 MMgal	Diesel Fuel

The source is required to limit the *plant-wide* emissions of any criteria pollutant to 100 ton during any consecutive 12-month period.

Regulations 5.01, 5.21, and 5.23 (STAR Program) establishes requirements for environmental acceptability of toxic air contaminants (TACs) and the requirement to comply with all applicable emission standards. An EA Technical Evaluation for Category 1 TACs was performed by District on 12/16/08, for Louisville Gas & Electric, Zorn Generating Station and the source meets the de minimis levels for Category 1 TACs.

The owner or operator shall not allow any TAC emissions to exceed environmentally acceptable levels whether specifically established by modeling or derived from default de minimis levels provided by the District. The owner or operator shall not increase the TAC content in raw material or substitute any raw materials or additional TACs for those identified in the initial permit application for this process or equipment that would result in an increase in the quantity of a TAC without prior notification to, and approval by, the District. (Regulation 5.01, section 3.)

b. Emission Unit U1 - Combustion Turbine

i. Equipment:

P/PE	Capacity	Installation Date	Applicable Regulation	Basis for Applicability
One (1) simple cycle, natural gas fired, combustion turbine with 300 bhp diesel cranking engine	19,400 KW (turbine rated)	1969	5.01	Regulation 5.01 establishes the requirements for Environmental Acceptability for TACs. Group 1 company with Category 1 TACs, which could exceed the de minimis values.
			6.42	Combustion turbine emitting large amounts of NO _x are subject to Regulation 6.42 for major nitrogen oxides emitting facilities.

ii. Standards/Operating Limits

a) NO_x

1. Regulation 6.42 establishes the RACT requirements for NO_x emitting facilities.
2. Fuel usage by the combustion turbine shall not exceed 612 MMcf of natural gas per year, that would allow emissions of the pollutant NO_x to exceed the one hundred (100) ton per twelve (12) consecutive month period limit for a criteria pollutant. The above fuel usage limit is based on emission factors from AP-42, table 3.1-1 for Stationary Gas Turbines and the following formula:

$$E_{\text{NO}_x} = (0.32 \text{ lb/MMbtu})(1,020 \text{ btu/cf})(X)(1\text{tn}/2,000 \text{ lb}) = \text{NO}_x \text{ tn/yr}$$

Where: E_{NO_x} = NO_x emissions (tons) during a consecutive 12-month period

X = the amount of natural gas (MMcf) combusted during a consecutive 12-month period

3. Fuel usage by the diesel cranking engine shall not exceed 0.326 MMgal of diesel fuel per year that would allow emissions of the pollutant NO_x to exceed the one hundred (100) ton per twelve (12) consecutive month period limit for a criteria pollutant. The above fuel usage limit is based on emission factors from AP-42, table 3.3-1 for Gasoline and Diesel Industrial Engines (less than 600 hp) and the following formula:

$$E_{\text{NO}_x} = (4.41 \text{ lb/MMbtu})(139,000 \text{ btu/gal})(X)(1\text{tn}/2,000 \text{ lb}) = \text{NO}_x \text{ tn/yr}$$

Where: E_{NO_x} = NO_x emissions (tons) during a consecutive 12-month period

X = the amount of diesel fuel (MMgal) combusted during a consecutive 12-month period

4. The total *plantwide* usage of fuel cannot exceed the 612 MMcf limit of natural gas for the combustion turbine or 0.326 MMgal of diesel fuel for the cranking engine, or any combination thereof, that would result in the total *plantwide* NO_x emissions exceeding one hundred (100) ton/yr in a twelve (12) consecutive month period.

iii. **Monitoring**

NO_x

Monthly records shall be maintained as required by Record Keeping iv. for the combustion turbine and diesel cranking engine to ensure the limits of the permit are complied with.

iv. **Record Keeping**

NO_x

Monthly records of the amount and type of fuel combusted at the facility when the equipment is operated and the hours of operation of

the equipment shall be maintained to demonstrate ongoing compliance with the annual limit for NO_x emissions.

v. **Reporting**

Semi-annual compliance reports that include the information listed below shall be submitted bi-annually to show compliance with limits of permit. Compliance reports shall clearly identify any deviations from any permit requirement. Compliance reports shall be postmarked within 60 days following the end of each reporting period. Compliance reports shall be signed by a responsible official and shall include a certification statement per Regulation 2.16, section 3.5.11.

a) **NO_x**

1. Emission unit ID number and emission point ID number.
2. Beginning and end date of the reporting period.
3. Identification of all periods of exceedances of the NO_x standard for the entire plant including the quantity of excess emissions.
4. Fuel usage and type combusted. Fuel analysis indicating the average annual heat content of the combusted fuels shall also be supplied, if company exercises the alternative to AP-42. (Section III, #6)
5. Identification of all periods of exceedance of the fuel usage limit.
6. Description of corrective action taken for the exceedance.

III. **Other Requirements**

1. **Temporary Sources:** The source did not request to operate any temporary facilities.
2. **Short Term Activities:** The source did not report any short term activities.
3. **Emissions Trading:** N/A

4. **Alternative Operating Scenarios:** The source did not request any Alternative Operating Scenarios.
5. **Compliance Status:** Louisville Gas & Electric, Zorn Generating Station is required to submit their annual Compliance Certification to the District on or before April 15th of each calendar year. As of the effective date of Permit 131-97-TV (R2), there are no compliance schedules in effect or progress reports required.
6. **Emission Factors:** The following emission factors shall be used unless more accurate District approved emission factors become available.

Equipment	Product	Emission Factor	EF Source
Combustion Turbine	Natural Gas	0.32 lb NO _x /MMbtu (EF rating, A)	AP-42 Table 3.1-1
Diesel Cranking Engine (300 bhp)	Diesel Fuel	4.41 lb NO _x /MMbtu (EF rating, D)	AP-42 Table 3.3-1

- a. Natural gas fuel usage limit in section 5.b.ii.2.. is based on a conversion factor of 1,020 btu/scf, per AP-42, table 3.1-1, note c.
- b. Diesel fuel usage limit in section 5.b.ii.2. is based on a conversion factor of 139 MMbtu/10³ gallons, per AP-42, table 3.1-1, note f.
- c. The AP-42, table 3.1-1 emission factors may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value, as stated in note b of AP-42, table 3.1-1.

7. Insignificant Activities

Equipment	Quantity	Basis for Exemption
Pressurized reservoir (contains 50/50 glycol-water), capacity less than 250 gallons	1	Reg. 2.02, section 2.3.26
Lube oil tank (vents only when running)	1	Reg. 2.02, section 2.3.9.2
Pressurized fuel oil tank (with no vent), turnover < 2X capacity	1	Reg. 2.02, section 2.3.26
Emergency relief vents	1	Reg. 2.02, 2.3.10

- a. Insignificant Activities are only those activities or processes falling into the general categories defined in District Regulation 2.02, Section 2, and not associated with a specific operation or process for which there is a specific regulation. Equipment associated with a specific operation or process (Emission Unit) shall be listed with the specific process even though there may be no applicable requirements. Information contained in the permit and permit summary shall clearly indicate that those items identified with negligible emissions have no applicable requirements.
- b. Activities identified In District Regulation 2.02, Section 2, may not require a permit and may be insignificant with regard to application disclosure requirements but may still have generally applicable requirements that continue to apply to the source and must be included in the Title V permit.
 - i. No facility, having been designated as an insignificant activity, shall be exempt from any generally applicable requirement which shall include a 20% opacity limit for facilities not otherwise regulated.
 - ii. No visible emission surveys or other monitoring shall be required for facilities designated as insignificant activities.
- c. For all insignificant activities that emit regulated air pollutants for which the company has accepted a plant-wide synthetic minor limit, the company shall maintain sufficient records to calculate the emissions and report those emissions in the semi-annual compliance reports and the annual emissions inventory report.
- d. The Insignificant Activities table is correct as of the date the permit was proposed for review by the USEPA, Region 4. The company shall submit an updated list of insignificant activities annually with the Title V compliance certification pursuant to District Regulation 2.16, section 4.3.5.3.6.